PATENT
Attorney Docket No.: 2000IP000227

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of:	Neal G. Skinner
Serial No.:	09/932,639
Filed:	August 17, 2001
Entitled:	MULTIPLEXED DISTRIBUTION OF OPTICAL POWER
Group Art Unit:	2633
Examiner:	R. Sedighian

APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Appellant hereby timely submits this Appeal Brief in triplicate under the provisions of 37 CFR §1.192(a) and respectfully requests consideration thereof before the Board of Patent Appeals and Interferences. Appellant's Notice of Appeal was filed on July 15, 2003, appealing to the Board from the decision of the examiner, mailed April 21, 2003, rejecting all of the pending claims of the above-identified patent application.

A check in the amount of $320.00 is enclosed herewith in payment of the fee specified in 37 CFR §1.17(c). The Commissioner is hereby authorized to charge any deficiency or credit any overpayment to deposit account no. 11-1543. A duplicate of this sheet is enclosed.

REAL PARTY IN INTEREST

The real party in interest is the assignee of the present application, Halliburton Energy Services, Inc. of Dallas, Texas.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to appellant, the appellant's legal representatives or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

STATUS OF CLAIMS

Claims 1-61 were originally filed in the present application. By an Amendment filed August 5, 2002, claims 1-10, 14-18, 21-24, 26, 29, 31-38 and 41-43 were canceled. Claims 11-13, 19, 20, 25, 27, 28, 30, 39, 40 and 44-61 remain pending. Each of the pending claims has been rejected at least twice, and these rejections of claims 11-13, 19, 20, 25, 27, 28, 30, 39, 40 and 44-61 are appealed.

STATUS OF AMENDMENTS

No amendment has been filed subsequent to any final rejection. The claims as set forth in Appendix A include changes to the claims made according to the Amendment filed August 5, 2002, which was entered by the examiner.

SUMMARY OF THE INVENTION

The present invention advances the art of selectively supplying electrical power and transmitting data to multiple well tools. In several of the embodiments described in the specification, each well tool is selected by transmitting a particular optical wavelength band through a single optical fiber. This use of a single optical fiber to permit selection from among multiple well tools reduces the cost and complexity which would be associated with using multiple optical fibers or electrical conductors in a well to communicate with or supply power to the multiple well tools.

The selection of a well tool is accomplished by transmitting the corresponding optical wavelength band through the optical fiber. A control module connected to the well tool receives the optical wavelength band. Each well tool has a control module connected thereto. A well tool is selected when its corresponding control module receives the corresponding optical wavelength band.

If a control module of a well tool receives its corresponding optical wavelength band, then an opto-electric converter associated with the control module converts the light transmitted thereto into electrical power. This electrical power may be used to power or actuate the well tool. Alternatively, data may be transmitted to the well tool by intermittently transmitting the corresponding optical wavelength band (to transmit digital 1's and 0's) or by

varying the intensity of the light transmitted in the optical wavelength band (to transmit analog data).

Multiple well tools may be selected by simultaneously transmitting corresponding multiple optical wavelength bands through the optical fiber. Multiple well tools may also be selected by configuring their associated control modules to respond to the same optical wavelength band transmitted through the optical fiber.

ISSUES

Whether claims 11, 12, 25, 27 and 28 are properly rejected under 35 USC §103(a) as being unpatentably obvious over U.S. Patent No. 4,495,421 to Endo et al. in view of U.S. Patent No. 6,351,323 to Onaka et al., or in view of U.S. Patent No. 6,025,948 to Gautheron.

Whether claims 13 and 30 are properly rejected under 35 USC §103(a) as being unpatentably obvious over Endo in view of U.S. Patent No. 5,502,783 to Wu et al.

Whether claims 19, 20, 39 and 40 are properly rejected under 35 USC §103(a) as being unpatentably obvious over Endo in view of U.S. Patent No. 5,677,781 to Mori et al.

Whether claims 44, 48, 49, 52, 53 and 56-61 are properly rejected under 35 USC §103(a) as being unpatentably obvious over U.S. Patent No. 6,271,766 to Didden et al.

Whether claims 45-47 are properly rejected under 35 USC §103(a) as being unpatentably obvious over Didden in view of U.S. Patent No. 6,115,156 to Otani et al.

Whether claims 50 and 51 are properly rejected under 35 USC §103(a) as being unpatentably obvious over Didden in view of U.S. Patent No. 4,182,935 to Chown.

Whether claims 54 and 55 are properly rejected under 35 USC §103(a) as being unpatentably obvious over Didden in view of U.S. Patent No. 4,346,478 to Sichling.

GROUPING OF CLAIMS

Although each of claims 11, 12, 25, 27 and 28 stands rejected as being obvious over Endo in view of Onaka or Gautheron, the claims of this group do not stand or fall together. Each of claims 13 and 30 stands rejected as being obvious over Endo in view of Wu, but the claims of this group also do not stand or fall together. Each of claims 19, 20, 39 and 40 stands rejected as being obvious over Endo in view of Mori, but the claims of this group also do not stand or fall together. Each of claims 44, 48, 49, 52, 53 and 56-61 stands rejected as being obvious over Didden, but the claims of this group also do not stand or fall together. Each of claims 45-47 stands rejected as being obvious over Didden in view of Otani, and the claims of this group stand or fall together. Each of claims 50 and 51 stands rejected as being obvious over Didden in view of Chown, but the claims of this group also do not stand or fall together. Each of claims 54 and 55

stands rejected as being obvious over Didden in view of Sichling, and the claims of this group stand or fall together.

With the exception of claims 45-47, and claims 54 and 55, the appellant submits that each of the rejected claims stands on its own recitation, and each claim is considered separately patentable for reasons set forth in more detail below.

ARGUMENT

Rejections under 35 USC §103(a)

Claims 11, 12, 25, 27 and 28 are rejected as being obvious over Endo in view of Onaka or Gautheron.

Claim 11 recites a method wherein multiple optical wavelength bands are transmitted simultaneously through a fiber optic line, thereby selecting corresponding multiple ones of power consuming devices interconnected to the fiber optic line. The multiple optical wavelength bands are transmitted through the fiber optic line by interconnecting to the fiber optic line an optical coupler which receives separate optical wavelength bands from multiple tunable filters.

Endo does describe wavelength division multiplexing being used to select and provide power to multiple devices in an automobile. However, Endo is not directed to the problem solved by the present invention, and does not provide the benefits of the present invention. Specifically, Endo is directed to the problem of preventing electromagnetic interference in audio systems of automobiles.

At the outset it should be noted that, instead of selectively supplying power or transmitting data to multiple devices using a single optical fiber as in the embodiments described in the present application, Endo requires: 1) an optical fiber 40, 2) an electrical power supply line 50, and 3) multiple optical fibers extending to each of multiple optical filters 12-1, 12-2, 12-3 (see FIG. 4 of Endo). Note, also, that Endo does not use the electrical power generated by the light transmitted through the optical fiber 40 to power the devices in the automobile. Instead, Endo merely uses the transmitted light to operate a switch which allows electrical power to flow to the device from the separate electrical power supply line 50.

Endo does not transmit multiple optical wavelength bands through a fiber optic line by interconnecting an optical coupler to the fiber optic line, as recited in claim 11, wherein the coupler receives separate optical wavelength bands from multiple tunable filters. Instead, Endo uses multiple couplers 11-1, 11-2, 11-3 to transmit multiple optical wavelengths generated by manual switch-actuated light emitting diodes 22. In an automobile, these separate manually-actuated switches 3 may provide a convenient means of operating various devices in the automobile, but they would be undesirable in the well environment of the embodiments described in the present specification.

Onaka is directed to the problem of high capacity multimedia communications networks using a fiber optic transmission line. The Onaka system is extraordinarily complex and unsuited for the problem addressed by

Endo, and so a person of ordinary skill in the art would definitely not be motivated to modify the Endo device to incorporate the teachings of Onaka.

Onaka proposes that multiple optical wavelengths be generated by corresponding multiple light emitting diodes 19 and then multiplexed in an 8x8 coupler 18 (see FIG. 2 of Onaka). The optical wavelengths are then demultiplexed in the coupler 18, amplified by amplifiers 15 and separately input to multiple acousto-optical tunable filters 14. The tuned wavelengths are then modulated by modulators 16 and input to an 8x1 coupler 12, amplified by an amplifier 21, and then input to another acousto-optical tunable filter 10.

Clearly, a person skilled in the art would not be motivated to modify the teachings of Endo using the system described by Onaka. Firstly, there is no suggestion or motivation expressed in either reference to make such a combination. As detailed in MPEP §2143.01, "[o]bviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. ... The mere fact that references <u>can</u> be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination."

Endo contains no such teaching, suggestion or motivation. Endo is directed to the problem of actuating electrical devices without causing interference in an audio system of an automobile. Certainly no automotive

engineer would even consider replacing the manually-operated switches of Endo with the extraordinarily complex multimedia communication network described by Onaka.

Onaka also contains no such teaching, suggestion or motivation. Onaka is directed to the problem of adding and dropping specified wavelengths in a multimedia communications network with maximum speed. The application of this technology to operating electrical devices in an automobile is not discussed at all in Onaka.

Secondly, a person skilled in the art would not make the combination suggested by the examiner, for to do so would render the Endo apparatus less desirable for its intended purpose. Endo is concerned with turning on and off selected automotive devices. Accordingly, certain optical wavelengths are either transmitted or not transmitted through an optical fiber.

In contrast, Onaka continuously transmits a full spectrum of optical wavelengths through the optical fiber, and drops/adds certain wavelengths from/to the optical fiber. A certain wavelength dropped from the optical fiber is also added to the optical fiber, so that the wavelength is continuously transmitted by the optical fiber. If such a technique were used in the Endo apparatus, then all of the automotive devices which correspond to the wavelengths transmitted by the optical fiber would operate continuously, not selectively.

Therefore, Endo is not properly combined with Onaka, and the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 11.

Gautheron, like Onaka, is also directed to the art of optical communications networks. The examiner asserts in paragraph 3 of the April 21, 2003 Office Action that Gautheron teaches an optical transmission system that is comprised of a plurality of optical tunable filters (60, 52). Contrary to the examiner's assertion, Gautheron teaches only one tunable filter 60 connected to the optical coupler 35. The other filter 52 described by Gautheron is not tunable, but is instead selected to transmit an optical wavelength other than the multiple wavelengths normally transmitted over the communication network, in order to monitor the status of various repeaters on the network.

Since Gautheron does not describe the features of the invention recited in claim 11 and missing from Endo, the examiner has not made out a *prima facie* case of obviousness of claim 11. Therefore, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 11.

Furthermore, Gautheron is not properly combined with Endo in the obviousness rejection of claim 11. Specifically, there is no motivation or suggestion in either of the references to make such a combination, and to make such a combination would render the Endo apparatus unsuited for its intended purpose.

Gautheron teaches a fiber optic communication system in which multiple optical wavelengths are continuously transmitted over an optical fiber 10. In

addition, branches of the optical fiber retransmit selected wavelengths back to the coupler and to other points in the system. See col. 3, line 63 thru col. 4, line 14 of Gautheron.

A person skilled in the art would definitely not be motivated to modify Endo to incorporate the teachings of Gautheron. To do so would unnecessarily complicate the Endo apparatus, which has no need for repeaters or the repeater monitoring system taught by Gautheron. The continuous transmission of the multiple wavelengths in the Endo apparatus would make it unsuited for its intended purpose of selectively operating the electrical devices in an automobile.

Therefore, for the additional reason that the Endo and Gautheron references are improperly combined, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 11.

Claim 12 recites that each of the tunable filters is interconnected between the first optical coupler and a second optical coupler, and each tunable filter receives a relatively broad optical wavelength band from the second optical coupler. The rejection of claim 12 stated in the Office Action appears to apply only Onaka in combination with Endo in making the rejection. Specifically, the examiner identifies the 8x8 coupler 18 of Onaka as the "second" optical coupler recited in claim 12.

The 8x8 coupler 18 of Onaka does not meet the limitations recited in claim 12, and so the examiner has failed to make out a *prima facie* case of obviousness of claim 12. The Onaka specification describes the 8x8 coupler 18 as multiplexing, and then demultiplexing, the multiple optical wavelengths

emitted by the laser diodes 19 (see col. 8, lines 25-30). Thus, each of the tunable filters 14 of Onaka receives a demultiplexed optical wavelength from the 8x8 coupler 18, and not a relatively broad optical wavelength band. The tunable filters 14 of Onaka are merely used to "fine tune" the optical wavelengths prior to being modulated by the modulators 16 and again being multiplexed in another coupler 12.

Therefore, a *prima facie* case of obviousness of claim 12 has not been made out by the examiner, and the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 12.

Furthermore, claim 12 is dependent from claim 11 and, thus, for the reasons discussed above in relation to the rejections of claim 11, the Endo and Onaka references are also not properly combined in making this obviousness rejection of claim 12. There is no motivation or suggestion expressed in either reference to make the combination, and to make the combination would render the Endo apparatus unsuited for its intended purpose. For these additional reasons, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 12.

Claim 25 is improperly rejected by the examiner as being obvious over a combination of the Endo and Onaka or Gautheron references, as with claims 11 and 12. Endo is not properly combined with either Onaka or Gautheron, since there is no motivation or suggestion in any of the references to combine them, and to do so would render the Endo apparatus less suited for its intended purpose.

For this reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 25.

Furthermore, claim 25 recites that the multiple optical wavelength bands are transmitted singly through the fiber optic line. Each of the Onaka and Gautheron references teaches directly away from this limitation of claim 25. This due at least in part to the fact that these references describe fiber optic communications systems, and not an electrical power distribution system, as recited in claim 25.

Onaka teaches simultaneous transmission of multiple optical wavelengths to the tunable filter 10 from the tributary. In the FIG. 2 embodiment of Onaka identified by the examiner as depicting the elements recited in the claim, eight optical wavelengths are simultaneously transmitted from the tunable filters 14. Gautheron teaches simultaneous transmission of at least four wavelengths (see FIGS. 1, 3 and 4) in a fiber optic communication system.

Therefore, each of the Onaka and Gautheron references teaches directly away from this limitation of claim 25, and so these references cannot be properly combined with Endo in an obviousness rejection the claim. For this additional reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 25.

Claim 27 is improperly rejected by the examiner as being obvious over a combination of the Endo and Onaka or Gautheron references, as with claims 11, 12 and 25. Endo is not properly combined with either Onaka or Gautheron, since there is no motivation or suggestion in any of the references to combine

them, and to do so would render the Endo apparatus less suited for its intended purpose. For this reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 27.

In addition, claim 27 recites that multiple tunable filters and an optical coupler are interconnected to the fiber optic line. This fiber optic line has the multiple optical wavelength bands transmitted therethrough to selectively supply power to respective power consuming devices. Gautheron does not teach multiple tunable filters interconnected to a fiber optic line. Instead, only one tuned filter 60 is used to transmit a single optical wavelength to the coupler 35. Therefore, the examiner has not made out a *prima facie* case of obviousness of claim 27, and for this additional reason the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 27.

Onaka teaches multiple tunable filters 14, but these filters are not used to transmit multiple optical wavelengths through an optical fiber to supply power to respective power consuming devices. Instead, the multiple optical wavelengths are continuously and simultaneously transmitted in Onaka, and not to supply power, but to provide communication channels on the fiber optic line. Therefore, Onaka teaches directly away from these limitations of claim 27, and for this additional reason the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 27.

Claim 28 is dependent from claim 27 and, thus, for the reasons discussed above in relation to the rejections of claim 27, Endo is also not properly combined with either Gautheron or Onaka in making this obviousness rejection of claim

28. There is no motivation or suggestion expressed in either reference to make the combination, and to make the combination would render the Endo apparatus unsuited for its intended purpose. The examiner has not made out a *prima facie* case of obviousness in regard to the combination of Endo with Gautheron, and Onaka teaches away from its combination with Endo. For these reasons, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 28.

In addition, claim 28 recites that each of the tunable filters is interconnected between the first optical coupler and a second optical coupler, and that each of the tunable filters receives a relatively broad optical wavelength band from the second optical coupler. As discussed above in relation to claim 12, the 8x8 coupler 18 of Onaka does not meet the limitations recited in claim 28, and so the examiner has failed to make out a *prima facie* case of obviousness of this claim. The Onaka specification describes each of the tunable filters 14 receiving a demultiplexed optical wavelength from the 8x8 coupler 18, and not a relatively broad optical wavelength band. The tunable filters 14 of Onaka are merely used to "fine tune" the optical wavelengths prior to being modulated by the modulators 16 and again being multiplexed in another coupler 12.

Therefore, a *prima facie* case of obviousness of claim 28 has not been made out by the examiner, and for this additional reason the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 28.

Claims 13 and 30 are rejected as being obvious over Endo in view of Wu.

Claim 13 recites a method of supplying electrical power to selected power consuming devices, wherein multiple optical wavelength bands are transmitted through a fiber optic line by interconnecting an optical coupler to the fiber optic line. The optical coupler receives separate optical wavelength bands from respective multiple tunable lasers.

The examiner concedes in the Office Action that Endo does not describe an optical coupler receiving multiple optical wavelength bands from respective multiple tunable lasers, but alleges that this feature of the invention is found in Wu, and that it would have been obvious to a person skilled in the art to incorporate the teachings of Wu into the Endo apparatus. However, this combination of references is improper.

Wu describes a tunable filter 25 used in an optical communications network. The objective is to enhance the speed of data transmission through an optical fiber 20 by more effectively using the available bandwidths for transmission through the fiber. Wu does not relate to the problem of selectively supplying electrical power to multiple power consuming devices. For this reason, Wu describes the multiple wavelength bands being transmitted continuously through the optical fiber.

A person skilled in the art would not be motivated to modify the Endo device to incorporate the teachings of Wu, for to do so would destroy the selective supplying of electrical power, which is the main benefit of the Endo apparatus. Furthermore, there is no motivation or suggestion in either reference to make the combination suggested by the examiner. Since there is no motivation to

make the combination, and to do so would make the Endo apparatus unsuited for its intended purpose, the combination of these references is improper. For this reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 13.

Furthermore, a careful reading of the Wu reference will reveal that Wu actually teaches away from the use of tunable lasers. Indeed, Wu eliminates the tunable lasers in his fiber optic communication system. The FIG. 1A embodiment (which includes the tunable lasers 12) is used by Wu as an example of what not to do in a fiber optic communication system. The problem with the FIG. 1A example, according to Wu, is that it is unable to process both transverse electric and transverse magnetic polarization modes (see col. 1, line 64 – col. 2, line 6 and col. 4, lines 1-7).

Instead of the FIG. 1A tunable lasers 12, Wu proposes to use fixed wavelength lasers 13 in combination with tunable filters 25 (shown in FIG. 1B). It is the use and construction of these tunable filters 25, not the tunable lasers 12, which is taught by Wu. As set forth in the Wu specification, "It is the tunable filter/receivers 25, 28 in FIG. 1B that are the subject of the present invention." (col. 4, lines 11-13).

Thus, it may be clearly seen that Wu teaches away from the use of tunable lasers. A person skilled in the art would be motivated by Wu not to use tunable lasers, but instead to use fixed wavelength lasers and tunable filters. Since Wu teaches directly away from the invention recited in claim 13, its combination with Endo in an obviousness rejection of claim 13 is improper, and for this

additional reason the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 13.

Claim 30 recites an electrical power distribution system in which electrical power is selectively supplied to multiple power consuming devices. An optical coupler interconnected to a fiber optic line receives separate optical wavelength bands from multiple lasers, at least one of which is a tunable laser. Endo does not teach the use of tunable lasers to transmit multiple wavelength bands through an optical fiber in order to selectively supply electrical power to multiple devices, and so the examiner has attempted to incorporate the teachings of Wu to resolve this deficiency of Endo.

However, as noted above in regard to claim 13, Wu is directed to the problem of increasing data transmission rate over a fiber optic communication system and has no relation to selectively supplying electrical power to power consuming devices. To incorporate the teachings of Wu into the Endo apparatus would render it unsuited for its intended purpose. Therefore, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 30.

In addition, claim 30 recites the use of at least one tunable laser to transmit the separate optical wavelength bands to the optical coupler. Wu teaches directly away from the use of tunable lasers. Instead, Wu teaches that fixed wavelength lasers at a transmission end of a communication network should be used in conjunction with tunable filters at a receiving end of the network. A person skilled in the art would not be motivated to produce the claim

30 invention based on a reading of the Endo and Wu references. Therefore, for this additional reason the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 30.

Claims 19, 20, 39 and 40 are rejected as being obvious over Endo in view of Mori.

Claim 19 recites a method wherein multiple optical wavelength bands are transmitted through an optical fiber to selectively supply electrical power to corresponding multiple device. The wavelength bands are selectively transmitted to thereby select which of the corresponding devices are to be supplied with electrical power. The devices are data storage devices, and data transmitted through the fiber optic line is stored in the devices selected by the transmission of the wavelength bands.

Endo does not relate to the transmission of data to storage devices. Instead, Endo is directed to the problem of selectively supplying electrical power to multiple devices in an automobile. A person skilled in the art would not be motivated to incorporate data storage into the Endo apparatus. No mention of data storage is made in Endo, and the Endo apparatus is not suited for data storage use. For example, the manual switches 20-1, 20-2, 20-3 of Endo are definitely unsuited for use in a data storage system. For this reason, the combination of Endo with Mori is improper, and the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 19.

The examiner states in section 5 of the Office Action that, "Endo teaches an electrical appliance includes various electrical loads such as motors, solenoid, air-conditioning heater, etc. It would have been obvious that such electrical appliances can be provided with electronic circuitries to store data, or they can be provided with installed programs to perform different function." This does not form a valid basis for an obviousness rejection. In fact, this is just the type of hindsight speculation which is counseled against in the MPEP: "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." MPEP §2143.01.

Contrary to the examiner's assertions, the Endo apparatus is particularly unsuited for data transmission to electrical appliances, and the mere fact that the Endo apparatus could be modified to incorporate this feature does not provide a proper basis for rejecting the claim as being obvious. It will be appreciated that most of the elements of the Endo apparatus would have to be replaced in order to make it suitable for data transmission. Therefore, for this additional reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 19.

Mori is directed to the problem of measuring noise in optical amplifiers. The elements identified by the examiner as being the data storage devices recited in claim 19 are actually light power measuring instruments FIG. 1, elements 9a-9c). A person skilled in the art would definitely not be motivated to substitute the light power measuring instruments of Mori into the automobile power supply

apparatus of Endo to produce the invention recited in claim 19. There is simply no reason to do so, since the Endo apparatus apparently has no need for measuring noise in an optical amplifier.

There clearly is no motivation to modify the Endo apparatus to incorporate the Mori light power measuring instruments. Furthermore, there is no motivation or suggestion expressed in either reference to make this combination of the Endo and Mori references. For this additional reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 19.

Claim 20 recites a method similar to that of claim 19, except that claim 20 recites that the devices have programmed functions, and the functions are performed in response to the supplying of electrical power to the devices selected by transmission of the corresponding optical wavelengths. The examiner asserts that the Mori reference teaches that the light power measuring instruments are connected to computers, and that this teaching in combination with Endo renders claim 20 obvious.

However, the combination of Endo with Mori is improper as discussed above in regard to claim 19. There is no motivation to make the combination proposed by the examiner. Neither reference contains any suggestion or teaching which would lead a person skilled in the art to make such a combination. Therefore, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 20.

In addition, Mori does not teach the selective transmission of optical wavelengths to select corresponding ones of multiple devices having programmed functions. Instead, Mori teaches connecting a single computer to the light power measuring devices. This computer is not selected by transmitting a certain optical wavelength. Thus, the examiner has not made out a *prima facie* case of obviousness of claim 20, and for this additional reason the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 20.

Furthermore, the various optical wavelengths of Mori are not selectively transmitted to select corresponding devices but are instead continuously transmitted and the computer is continuously monitoring the light power measuring instruments to determine a noise figure of an optical amplifier. Thus, Mori teaches directly away from the invention recited in claim 20, and for this additional reason the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 20.

Claim 39 recites a system in which multiple control modules receive optical wavelength bands, each of which causes one of the control modules to select a data storage device for supplying electrical power thereto. As discussed above in regard to claim 19, there is no motivation to modify the Endo apparatus to incorporate the light power measuring devices described by Mori. The Mori light power measuring instruments, used to determine a noise figure of an optical amplifier, would not find application in Endo's electrical power supply system for an automobile. Furthermore, there is no motivation or suggestion

expressed in either reference for making the combination proposed by the examiner. For these reasons, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 39.

In addition, the substitution of the Mori light power measuring instruments for the electrical appliances of Endo would make the Endo apparatus unsuited for its intended purpose. The purpose of the Endo apparatus is to selectively supply electrical power to devices in an automobile, without causing interference in an audio system of the automobile. If the Mori light power measuring instruments were substituted for the Endo automotive electrical appliances, then an automobile user who actuates one of the switches would be very dissatisfied with the result. Therefore, since the combination of Endo with Mori would make the Endo apparatus unsuited for its intended purpose, then for this additional reason the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 39.

Claim 40 recites a system in which devices which have programmed functions are selected by selectively transmitting corresponding optical wavelength bands via a fiber optic line to control modules interconnected between the fiber optic line and the devices. The programmed function of a device is performed in response to electrical power supplied thereto when the corresponding control module selects the device in response to transmission of the corresponding optical wavelength band.

As discussed above in regard to claim 20, the combination of Endo with Mori as proposed by the examiner is improper. There is no motivation to

combine these references. There is no teaching or suggestion in either reference to make such a combination. Furthermore, to make the combination would render the Endo apparatus unsuited for its intended purpose, Mori teaches away from the recited invention, and the examiner has not made out a *prima facie* case of obviousness. For each of these multiple reasons, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 40.

In addition, claim 40 requires that each of the transmitted optical wavelength bands causes one of the control modules to select the respective device having a programmed function for supplying electrical power thereto. Mori does not teach that the computer connected to the light power measuring instruments is selected by a control module in response to transmission of a particular optical wavelength band. Instead, there is no selection of the computer by a control module when corresponding optical wavelengths are transmitted. Therefore, for this additional reason the examiner has not made out a *prima facie* case of obviousness of claim 40, and the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 40.

Claims 44, 48, 49, 52, 53 and 56-61 are rejected as being obvious over Didden.

Claim 44 recites a well tool control system for selectively supplying electrical power to multiple electrical power consuming well tools in a well. Each of the well tools has an opto-electric converter interconnected between the well tool and a corresponding one of multiple control modules. Each of the control

modules is responsive to one of multiple optical wavelength bands transmitted through a fiber optic line to cause light to be transmitted to the corresponding opto-electric converter, thereby causing electrical power to be supplied to the respective well tool.

In section 6 of the Office Action, the examiner acknowledges that Didden does not describe the invention recited in claim 44, but alleges that it would have been obvious to a person skilled in the art that Didden actually includes the features of claim 44. This is incorrect and is an improper basis for making an obviousness rejection of the claim.

Didden describes the use of latent fiber optic sensors, such as fiber Bragg grating sensors, distributed in a well. Such sensors do not contain opto-electric converters, do not have control modules associated therewith, and are not selected by causing light to be transmitted to a corresponding opto-electric converter. Therefore, the examiner has not made out a *prima facie* case of obviousness of claim 44, and for this reason the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 44.

Didden does describe that certain wavelengths may be transmitted to select corresponding ones of the sensors. However, Didden also teaches that light reflected back to the surface from the selected sensors is converted to electrical signals at a central instrumentation box 20 at the surface. Thus, Didden teaches directly away from the multiple control modules and opto-electric converters associated with the corresponding well tools recited in claim 44.

Didden also teaches away from interconnecting the opto-electric converters between the control modules and the well tools as recited in claim 44. Instead, Didden teaches that a single converter 22 be used at the surface. Therefore, it may be clearly seen that Didden teaches a very different system from that recited in claim 44, Didden actually teaches away from the features of the system of claim 44, and for this additional reason the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 44.

Didden does not describe any selective electrical power distribution via selective wavelength transmission as recited in claim 44. Instead, Didden describes selective illumination of Bragg grating-type sensors. Alternatively, Didden describes the selective conversion of the sensor outputs to electrical signals, but this is not accomplished by selective wavelength transmission to the sensors, and selective wavelength transmission is not used to provide electrical power to selected ones of the sensors. Therefore, for this additional reason the examiner has not made out a *prima facie* case of obviousness of claim 44.

Claim 48 is dependent from claim 44 and, thus, the reasons given above for the impropriety of the obviousness rejection of claim 44 also apply to the obviousness rejection of claim 48. For multiple reasons the examiner has not made out a *prima facie* case of obviousness, and in multiple ways the Didden reference actually teaches away from the claimed invention. Therefore, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 48.

In addition, claim 48 recites that multiple optical wavelength bands are transmitted singly through the fiber optic line. The examiner (in section 6 of the Office Action) points to col. 4, lines 40-48 of Didden as a description of this feature recited in claim 48. This portion of the Didden specification is reproduced below:

> Any known multiplexing techniques may be used by the instrumentation box 20 to distinguish one sensor signal from another sensor signal, such as wavelength division multiplexing (WDM) or time division multiplexing (TDM) or other multiplexing techniques. In that case, the characteristic or reflection wavelength of the grating (or gratings) in each sensor 12 may have one or more different reflection or characteristic wavelength(s) (e.g., $\lambda 1$, $\lambda 2$, $\lambda 3$, λn).

It would be readily apparent to any person skilled in the art that this passage from Didden does not describe what the examiner asserts it describes. The passage does not describe transmitting multiple optical wavelengths singly through a fiber optic line. Instead, the passage describes each sensor having one or more characteristic wavelengths which are distinguished by the instrumentation box at the surface using various multiplexing techniques.

Clearly, the examiner has not made out a *prima facie* case of obviousness of claim 48, and for this additional reason the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 48.

Claim 49 is dependent from claim 44 and, thus, the reasons given above for the impropriety of the obviousness rejection of claim 44 also apply to the obviousness rejection of claim 49. For multiple reasons the examiner has not

made out a *prima facie* case of obviousness, and in multiple ways the Didden reference actually teaches away from the claimed invention. Therefore, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 49.

In addition, claim 49 recites that the multiple optical wavelength bands are transmitted simultaneously through the fiber optic line. The examiner again points to the above-quoted passage from the Didden specification as a description of this feature recited in claim 49. The passage does describe each sensor as having one or more characteristic wavelengths, but it does not describe the wavelengths as being transmitted simultaneously though the fiber optic line. Therefore, the examiner has not made out a *prima facie* case of obviousness of claim 49, and for this additional reason the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 49.

Claim 52 is dependent from claim 49 and, thus, the reasons given above for the impropriety of the obviousness rejection of claim 49 also apply to the obviousness rejection of claim 52. For multiple reasons the examiner has not made out a *prima facie* case of obviousness, and in multiple ways the Didden reference actually teaches away from the claimed invention. Therefore, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 52.

In addition, claim 52 recites that an optical coupler is interconnected to the fiber optic line and receives separate optical wavelength bands from multiple lasers. The examiner asserts (in section 6 of the Office Action) that this feature is

described in col. 3, line 35 and col. 4, lines 30-32 of the Didden specification. These portions of Didden are reproduced below:

> A plurality of optical grating based sensors 12 are disposed along and coupled to the optical fiber 10, e.g., by having the sensors 1 2 be feed-through sensors and being connected in series to the common optical fiber 10.
>
> The instrumentation box 20 comprises an optical transceiver/converter 22 comprising a known broadband source, a scanned laser light source, or other suitable known optical source to provide the incident light 14.

Clearly, these portions of Didden do not describe an optical coupler receiving separate optical wavelength bands from multiple lasers, and these portions of Didden do not describe an optical coupler interconnected to the fiber optic line. Instead, these passages describe sensors coupled to a fiber optic line, and a single laser light source. For these multiple additional reasons the examiner has not made out a *prima facie* case of obviousness of claim 52, and the Board is therefore respectfully requested to direct the examiner to withdraw this rejection of claim 52.

Claim 53 is dependent from claim 52 and, thus, the reasons given above for the impropriety of the obviousness rejection of claim 52 also apply to the obviousness rejection of claim 53. For multiple reasons the examiner has not made out a *prima facie* case of obviousness, and in multiple ways the Didden reference actually teaches away from the claimed invention. Therefore, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 53.

In addition, claim 53 recites that at least one of the multiple lasers is a tunable laser. The examiner points to col. 4, lines 31-32 and col. 7, lines 50-53 of the Didden specification as a description of this feature recited in claim 53. The first passage is reproduced above. Clearly, no mention is made in that passage of the use of a tunable laser. Instead, the passage describes a single scanned laser light source. As any person of skill in the art will attest, a scanned laser light source is quite different from a tunable laser.

The second passage, which is actually claim 13 of the Didden patent, is reproduced below:

> 13. The apparatus of claim 1, wherein at least one of said sensors has at least one fiber laser, wherein said fiber laser lases at lasing wavelength which changes as said sensed parameter changes.

Again, the quoted passage does not describe what the examiner asserts that it describes. This claim does not describe a tunable laser which transmits an optical wavelength band to an optical coupler. Therefore, for this additional reason the examiner has not made out a *prima facie* case of obviousness of claim 53, and the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 53.

Claim 56 is dependent from claim 44 and, thus, the reasons given above for the impropriety of the obviousness rejection of claim 44 also apply to the obviousness rejection of claim 56. For multiple reasons the examiner has not made out a *prima facie* case of obviousness, and in multiple ways the Didden reference actually teaches away from the claimed invention. Therefore, the

Board is respectfully requested to direct the examiner to withdraw this rejection of claim 56.

Furthermore, claim 56 recites that electrical power is supplied to the selected well tools in a manner which transmits data in a selected one of digital and analog form. The examiner identifies the Didden sensors 12 as being the well tools recited in claim 44 and its dependents. From a careful reading of Didden, it is apparent that electrical power is not supplied to any of the sensors. Instead, the sensors are merely illuminated by light transmitted through the fiber optic line. Therefore, for this additional reason the examiner has not made out a *prima facie* case of obviousness of claim 56, and the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 56.

Claim 57 is dependent from claim 44 and, thus, the reasons given above for the impropriety of the obviousness rejection of claim 44 also apply to the obviousness rejection of claim 57. For multiple reasons the examiner has not made out a *prima facie* case of obviousness, and in multiple ways the Didden reference actually teaches away from the claimed invention. Therefore, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 57.

In addition, claim 57 recites that the well tools are data storage devices. The sensors of Didden, which the examiner identifies as the well tools recited in claim 44 and its dependents, clearly are not data storage devices. They are sensors which are not described as having any data storage capabilities. Therefore, for this additional reason the examiner has not made out a *prima facie*

case of obviousness of claim 57, and the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 57.

Claim 58 is dependent from claim 44 and, thus, the reasons given above for the impropriety of the obviousness rejection of claim 44 also apply to the obviousness rejection of claim 58. For multiple reasons the examiner has not made out a *prima facie* case of obviousness, and in multiple ways the Didden reference actually teaches away from the claimed invention. Therefore, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 58.

Furthermore, claim 58 recites that the well tools are devices having programmed functions, each of the devices performing its respective function in response to electrical power being supplied thereto. As discussed above, the Didden sensors do not have electrical power supplied thereto. The Didden sensors also do not have programmed functions. The Didden sensors furthermore do not perform any function in response to electrical power being supplied thereto. Therefore, for these additional multiple reasons, the examiner has not made out a *prima facie* case of obviousness of claim 58, and the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 58.

Claim 59 is dependent from claim 44 and, thus, the reasons given above for the impropriety of the obviousness rejection of claim 44 also apply to the obviousness rejection of claim 59. For multiple reasons the examiner has not made out a *prima facie* case of obviousness, and in multiple ways the Didden reference actually teaches away from the claimed invention. Therefore, the

Board is respectfully requested to direct the examiner to withdraw this rejection of claim 59.

Furthermore, Claim 59 recites that at least one sensor is interconnected in the fiber optic line. Didden does describe multiple sensors 12 interconnected in a fiber optic line 10. However, the examiner has identified these sensors as being the well tools recited in claim 44 and its dependents. These well tools, which have respective control modules and opto-electric converters (as recited in claim 44) cannot also be the sensor recited in claim 59. Therefore, for this additional reason, the examiner has not made out a *prima facie* case of obviousness of claim 59, and the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 59.

Claim 60 is dependent from claim 59, which is dependent from claim 44 and, thus, the reasons given above for the impropriety of the obviousness rejections of claims 44 and 59 also apply to the obviousness rejection of claim 60. For multiple reasons the examiner has not made out a *prima facie* case of obviousness, and in multiple ways the Didden reference actually teaches away from the claimed invention. Therefore, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 60.

In addition, claim 60 recites that the sensor includes an intrinsic fiber Bragg grating. Didden does describe the sensors 12 as including fiber Bragg gratings. However, if the sensors 12 of Didden are the well tools recited in claim 44 and its dependents, as asserted by the examiner, then there are no additional sensors described by Didden which include fiber Bragg gratings. Fiber Bragg

grating sensors are not supplied with electrical power in the Didden reference, and so the examiner's assertion that the sensors 12 are both the electrically-powered well tools and the sensors recited in claim 60 is clearly erroneous. Therefore, for this additional reason, the examiner has not made out a *prima facie* case of obviousness of claim 60, and the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 60.

Claim 61 is dependent from claim 59, which is dependent from claim 44 and, thus, the reasons given above for the impropriety of the obviousness rejections of claims 44 and 59 also apply to the obviousness rejection of claim 61. For multiple reasons the examiner has not made out a *prima facie* case of obviousness, and in multiple ways the Didden reference actually teaches away from the claimed invention. Therefore, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 61.

Furthermore, claim 61 recites that there are multiple sensors interconnected in the fiber optic line. Didden does describe multiple sensors 12 interconnected in a fiber optic line 10. However, the examiner has identified these sensors as being the well tools recited in claim 44 and its dependents. These well tools, which have respective control modules and opto-electric converters (as recited in claim 44) cannot also be the sensors recited in claim 61. Therefore, for this additional reason, the examiner has not made out a *prima facie* case of obviousness of claim 61, and the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 61.

Claims 45-47 are rejected as being obvious over Didden in view of Otani.

Claims 45-47 are dependent from claim 44 and, thus, the reasons given above for the impropriety of the obviousness rejection of claim 44 also apply to the obviousness rejections of claims 45-47. For multiple reasons the examiner has not made out a *prima facie* case of obviousness, and in multiple ways the Didden reference actually teaches away from the claimed invention. Therefore, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 45.

In addition, claims 45-47 recite that each of the control modules includes a WDM drop interconnected between the fiber optic line and the respective well tool. At the outset it should be noted that Didden does not describe any control module interconnected between the fiber optic line 10 and each of the sensors 12 for selecting the sensors. Instead, Didden performs the selection function at the surface instrumentation box 20, by transmitting only selected wavelengths, filtering out unselected wavelengths reflected back from the sensors, or only displaying the information received from selected sensors. Thus, Didden itself teaches directly away from the invention recited in claims 45-47, and for this additional reason the Board is respectfully requested to direct the examiner to withdraw these rejections of claims 45-47.

Furthermore, the combination of Didden with Otani is improper. Otani describes a fiber optic communication system which uses fiber Bragg gratings 28 and optical circulators 27, or optical filters 15, 16, 17, 18 to separate out specific wavelengths transmitted through an optical fiber 1. Perhaps these elements of

Otani could be used in the surface instrumentation box 20 of Didden, in order to separate out the various wavelengths reflected back from the sensors 12, but the Didden system would be compromised if these elements of Otani were to be incorporated into control modules associated with each of the sensors.

The Didden sensors 12 are connected in series to the optical fiber 10 (see col. 3, lines 34-37). This series connection of the sensors 12 to the optical fiber 10 enables each of the sensors to receive optical wavelengths transmitted through the optical fiber. The Otani fiber Bragg gratings 28 and optical circulators 27 or optical filters 15, 16, 17, 18 would not be practical for use in conjunction with the Didden sensors 12, for to do so would make the Didden system unsuited for its intended purpose. Therefore, for this additional reason the obviousness rejections of claims 45-47 are improper, and the Board is respectfully requested to direct the examiner to withdraw these rejections of claims 45-47.

Claims 50 and 51 are rejected as being obvious over Didden in view of Chown.

Claim 50 is dependent from claim 49, which is dependent from claim 44 and, thus, the reasons given above for the impropriety of the obviousness rejections of claims 44 and 49 also apply to the obviousness rejection of claim 50. For multiple reasons the examiner has not made out a *prima facie* case of obviousness, and in multiple ways the Didden reference actually teaches away from the claimed invention. Therefore, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 50.

In addition, claim 50 recites that multiple tunable filters and an optical coupler are interconnected to the fiber optic line. The optical coupler receives separate optical wavelength bands from the multiple tunable filters.

The examiner asserts (in section 8 of the Office Action) that Chown describes the recited tunable filters in col. 1, lines 52-54, in col. 3, line 19, and in FIGS. 5 and 6). The FIGS. 5 and 6 do depict filters, but they are not described as being tunable filters. The passages of Chown identified by the examiner are reproduced below:

> FIG. 6 is a block diagram illustrating the use of a combination of optical filters and optical delay lines to discriminate between sensor devices.
>
> The individual fibers now incorporate different color filters $\lambda 1$, $\lambda 2$ and $\lambda 3$ instead of delays.

As can be clearly seen, these passages definitely do not describe the use of tunable filters. Therefore, for this additional reason the examiner has not made out a *prima facie* case of obviousness of claim 50, and the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 50.

Claim 51 is dependent from claim 50, which is dependent from claim 49, which is dependent from claim 44. Thus, the reasons given above for the impropriety of the obviousness rejections of claims 44, 49 and 50 also apply to the obviousness rejection of claim 51. For multiple reasons the examiner has not made out a *prima facie* case of obviousness, and in multiple ways the Didden reference actually teaches away from the claimed invention. Therefore, the

Board is respectfully requested to direct the examiner to withdraw this rejection of claim 51.

Furthermore, claim 51 recites that each of the tunable filters is interconnected between first and second optical couplers, each of the tunable filters receiving a relatively broad optical wavelength band from the second optical coupler. As discussed above, Chown does not describe the use of tunable filters. Accordingly, Chown also does not describe each of multiple tunable filters being interconnected between optical couplers and receiving a relatively broad optical wavelength band from one of the optical couplers. For this additional reason, the examiner has not made out a *prima facie* case of obviousness of claim 51, and the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 51.

Claims 54 and 55 are rejected as being obvious over Didden in view of Sichling.

Claims 54 and 55 are dependent from claim 44 and, thus, the reasons given above for the impropriety of the obviousness rejection of claim 44 also apply to the obviousness rejections of claims 54 and 55. For multiple reasons the examiner has not made out a *prima facie* case of obviousness, and in multiple ways the Didden reference actually teaches away from the claimed invention. Therefore, the Board is respectfully requested to direct the examiner to withdraw these rejections of claims 54 and 55.

In addition, claim 54 recites that each of the opto-electric converters interconnected between the control modules and the well tools is connected to a switch interconnected between at least one power supply and the respective well tool. As discussed above, Didden does not describe any opto-electric converters interconnected between control modules and well tools, so the basic premise stated by the examiner in the Office Action for rejecting claims 54 and 55 is in error.

It is unclear how the examiner is proposing to modify Didden to incorporate the teachings of Sichling. The examiner asserts (in section 9 of the Office Action) that Sichling discloses an opto-electric converter 34 that is connected to a switch 70, and then states that it would be obvious to incorporate a sensor system with opto-electric conversion circuitry and a switch such as the one of Sichling for the optical sensors in the measurement system of Didden. This does not make sense and is not a valid basis for rejecting claims 54 and 55.

It is apparent that the examiner has merely searched for and found an opto-electric converter in a circuit with a switch, and then asserted, without any valid reason therefor, that these elements would be obvious to incorporate in the Didden system. This amounts to nothing more than using the applicant's claims as a recipe to go find the various recited elements and allege that their combination would be obvious.

Firstly, as discussed above in regard to claim 44, Didden does not describe multiple control modules interconnected to a fiber optic line, and does not describe any opto-electric converters interconnected between the control

modules and the well tools, and does not describe each of the control modules responding to one of multiple optical wavelength bands transmitted through the fiber optic line to cause light to be transmitted to the respective opto-electric converter and thereby cause electrical power to be supplied to the respective well tool. Instead, Didden describes multiple sensors coupled to a fiber optic line and a surface instrumentation box which may transmit or receive certain optical wavelengths through the fiber optic line.

The examiner has attempted to cure these deficiencies in Didden by asserting that Sichling describes an opto-electric converter and a switch. Sichling does describe an opto-electric converter 46 and a switch 70, but these elements are not arranged as called for in claims 44, 54 and 55, and the manner in which Didden might be modified to incorporate these elements of Sichling is not provided by the examiner. Therefore, the examiner has failed to make out a *prima facie* case of obviousness of claims 54 and 55, and for this additional reason the Board is respectfully requested to direct the examiner to withdraw the rejections of claims 54 and 55.

Secondly, Sichling does not describe the opto-electric converter 46 as being interconnected between any control module and a well tool or other device. Instead, the Sichling opto-electric converter 46 receives light 45 directly from an optical fiber 6 via a branch 24. Thus, even with the addition of the teachings of Sichling, there still is no description in these references of a control module which causes light to be transmitted to an opto-electric converter in response to

one of multiple optical wavelength bands transmitted through the fiber optic line.

Instead, Sichling teaches that the light transmitted through the optical fiber 6 is continuously transmitted to the opto-electric converter 46. The switch 70 is only actuated when a predetermined address code is received by the opto-electric converter 46. Therefore, not only has the examiner failed to make out a *prima facie* case of obviousness of claims 54 and 55 because the combination of references would not produce all of the elements and limitations recited in these claims, Sichling actually teaches away from the invention recited in these claims. For these additional multiple reasons, the Board is respectfully requested to direct the examiner to withdraw these rejections of claims 54 and 55.

CONCLUSION

For the foregoing reasons, it is submitted that the examiner's rejections of claims 11-13, 19, 20, 25, 27, 28, 30, 39, 40 and 44-61 in the Office Action are in error, and reversal of his decisions is respectfully requested.

Respectfully submitted,

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I hereby certify that this correspondence and the documents referred to as attached therein are being deposited with the United States Postal Service in an envelope as "Express Mail Post Office to Addressee" service under 37 CFR 1.10 addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450,

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APPENDIX A

[The claims as rejected]

11. A method of providing electrical power to multiple power consuming devices, the method comprising the steps of:

interconnecting each of the power consuming devices to a fiber optic line, so that each of the power consuming devices is selectable for operation thereof by transmitting one of multiple optical wavelength bands through the fiber optic line, and wherein each of the transmitted optical wavelength bands causes a respective at least one of the power consuming devices to be selected; and

transmitting various of the optical wavelength bands through the fiber optic line, thereby supplying electrical power to corresponding selected ones of the power consuming devices,

the transmitting step further comprising simultaneously transmitting multiple ones of the optical wavelength bands through the fiber optic line, thereby selecting corresponding multiple ones of the power consuming devices for operation thereof,

the multiple optical wavelength bands being transmitted through the fiber optic line by interconnecting a first optical coupler to the fiber optic line, the first optical coupler receiving separate optical wavelength bands from multiple tunable filters.

12. The method according to Claim 11, wherein each of the tunable filters is interconnected between the first optical coupler and a second optical

coupler, each of the tunable filters receiving a relatively broad optical wavelength band from the second optical coupler.

13. A method of providing electrical power to multiple power consuming devices, the method comprising the steps of:

interconnecting each of the power consuming devices to a fiber optic line, so that each of the power consuming devices is selectable for operation thereof by transmitting one of multiple optical wavelength bands through the fiber optic line, and wherein each of the transmitted optical wavelength bands causes a respective at least one of the power consuming devices to be selected; and

transmitting various of the optical wavelength bands through the fiber optic line, thereby supplying electrical power to corresponding selected ones of the power consuming devices,

the transmitting step further comprising simultaneously transmitting multiple ones of the optical wavelength bands through the fiber optic line, thereby selecting corresponding multiple ones of the power consuming devices for operation thereof,

the multiple optical wavelength bands being transmitted through the fiber optic line by interconnecting an optical coupler to the fiber optic line, the optical coupler receiving separate optical wavelength bands from respective multiple tunable lasers.

19. A method of providing electrical power to multiple power consuming devices, the method comprising the steps of:

interconnecting each of the power consuming devices to a fiber optic line, so that each of the power consuming devices is selectable for operation thereof by transmitting one of multiple optical wavelength bands through the fiber optic line, and wherein each of the transmitted optical wavelength bands causes a respective at least one of the power consuming devices to be selected; and

transmitting various of the optical wavelength bands through the fiber optic line, thereby supplying electrical power to corresponding selected ones of the power consuming devices,

the power consuming devices being data storage devices, and wherein in the transmitting step, data transmitted through the fiber optic line is stored in corresponding selected ones of the data storage devices.

20. A method of providing electrical power to multiple power consuming devices, the method comprising the steps of:

interconnecting each of the power consuming devices to a fiber optic line, so that each of the power consuming devices is selectable for operation thereof by transmitting one of multiple optical wavelength bands through the fiber optic line, and wherein each of the transmitted optical wavelength bands causes a respective at least one of the power consuming devices to be selected; and

transmitting various of the optical wavelength bands through the fiber optic line, thereby supplying electrical power to corresponding selected ones of the power consuming devices,

the power consuming devices being devices having programmed functions, and wherein in the transmitting step, the functions are performed in response to the supplying of electrical power to the corresponding selected ones of the devices.

25. An electrical power distribution system, comprising:

a fiber optic line;

multiple power consuming devices; and

multiple control modules interconnected between the fiber optic line and the power consuming devices, each of the control modules being interconnected between the fiber optic line and one of the power consuming devices, and each of the control modules being operative to select the respective power consuming device for supplying electrical power thereto in response to one of multiple optical wavelength bands transmitted through the fiber optic line, each of the optical wavelength bands causing one of the control modules to select the respective power consuming device for supplying electrical power thereto,

the multiple optical wavelength bands being transmitted singly through the fiber optic line.

27. An electrical power distribution system, comprising:

a fiber optic line;

multiple power consuming devices;

multiple control modules interconnected between the fiber optic line and the power consuming devices, each of the control modules being interconnected between the fiber optic line and one of the power consuming devices, and each of the control modules being operative to select the respective power consuming device for supplying electrical power thereto in response to one of multiple optical wavelength bands transmitted through the fiber optic line, each of the optical wavelength bands causing one of the control modules to select the respective power consuming device for supplying electrical power thereto; and

multiple tunable filters and a first optical coupler interconnected to the fiber optic line, the first optical coupler receiving separate optical wavelength bands from the multiple tunable filters.

28. The system according to Claim 27, wherein each of the tunable filters is interconnected between the first optical coupler and a second optical coupler, each of the tunable filters receiving a relatively broad optical wavelength band from the second optical coupler.

30. An electrical power distribution system, comprising:

a fiber optic line;

multiple power consuming devices;

multiple control modules interconnected between the fiber optic line and the power consuming devices, each of the control modules being interconnected between the fiber optic line and one of the power consuming devices, and each of the control modules being operative to select the respective power consuming device for supplying electrical power thereto in response to one of multiple optical wavelength bands transmitted through the fiber optic line, each of the optical wavelength bands causing one of the control modules to select the respective power consuming device for supplying electrical power thereto, the multiple optical wavelength bands being transmitted simultaneously through the fiber optic line; and

an optical coupler interconnected to the fiber optic line, the optical coupler receiving separate optical wavelength bands from multiple lasers, at least one of the multiple lasers being a tunable laser.

39. An electrical power distribution system, comprising:

a fiber optic line;

multiple power consuming devices; and

multiple control modules interconnected between the fiber optic line and the power consuming devices, each of the control modules being interconnected between the fiber optic line and one of the power consuming devices, and each of the control modules being operative to select the respective power consuming

device for supplying electrical power thereto in response to one of multiple optical wavelength bands transmitted through the fiber optic line, each of the optical wavelength bands causing one of the control modules to select the respective power consuming device for supplying electrical power thereto,

the power consuming devices being data storage devices.

40. An electrical power distribution system, comprising:

a fiber optic line;

multiple power consuming devices; and

multiple control modules interconnected between the fiber optic line and the power consuming devices, each of the control modules being interconnected between the fiber optic line and one of the power consuming devices, and each of the control modules being operative to select the respective power consuming device for supplying electrical power thereto in response to one of multiple optical wavelength bands transmitted through the fiber optic line, each of the optical wavelength bands causing one of the control modules to select the respective power consuming device for supplying electrical power thereto,

the power consuming devices being devices having programmed functions, each of the devices performing its respective function in response to electrical power supplied thereto.

44. A well tool control system for selectively supplying electrical power to multiple electrical power consuming well tools in a subterranean well, the system comprising:

a fiber optic line extending in the well;

multiple control modules interconnected to the fiber optic line; and

multiple opto-electric converters, each of the opto-electric converters being interconnected between a respective one of the control modules and a respective one of the well tools, and

wherein each of the control modules is responsive to one of multiple optical wavelength bands transmitted through the fiber optic line to cause light to be transmitted to the respective opto-electric converter and thereby cause electrical power to be supplied to the respective well tool.

45. The system according to Claim 44, wherein each of the control modules includes a WDM drop interconnected between the fiber optic line and the respective well tool.

46. The system according to Claim 45, wherein each of the WDM drops includes an optical circulator and a Bragg grating interconnected to the fiber optic line.

47. The system according to Claim 44, wherein each of the control modules includes an optical coupler interconnected to the fiber optic line and an optical filter interconnected between the optical coupler and the power consuming device, the optical filter passing a selected one of the optical wavelength bands.

48. The system according to Claim 44, wherein the multiple optical wavelength bands are transmitted singly through the fiber optic line.

49. The system according to Claim 44, wherein the multiple optical wavelength bands are transmitted simultaneously through the fiber optic line.

50. The system according to Claim 49, further comprising multiple tunable filters and a first optical coupler interconnected to the fiber optic line, the first optical coupler receiving separate optical wavelength bands from the multiple tunable filters.

51. The system according to Claim 50, wherein each of the tunable filters is interconnected between the first optical coupler and a second optical coupler, each of the tunable filters receiving a relatively broad optical wavelength band from the second optical coupler.

52. The system according to Claim 49, further comprising an optical coupler interconnected to the fiber optic line, the optical coupler receiving separate optical wavelength bands from multiple lasers.

53. The system according to Claim 52, wherein at least one of the multiple lasers is a tunable laser.

54. The system according to Claim 44, wherein each of the opto-electric converters is connected to a switch interconnected between at least one power supply and the respective well tool.

55. The system according to Claim 54, wherein the switch is a field effect transistor.

56. The system according to Claim 44, wherein electrical power is supplied to the selected well tools in a manner which transmits data in a selected one of digital and analog form.

57. The system according to Claim 44, wherein the well tools are data storage devices.

58. The system according to Claim 44, wherein the well tools are devices having programmed functions, each of the devices performing its respective function in response to electrical power being supplied thereto.

59. The system according to Claim 44, further comprising at least one sensor interconnected in the fiber optic line.

60. The system according to Claim 59, wherein the sensor includes an intrinsic fiber Bragg grating.

61. The system according to Claim 59, wherein there are multiple sensors interconnected in the fiber optic line.